

CLAIMS

We claim:

1. An online bearing monitor for controlling the lubricating activity of a bearing luber,
5 comprising:
 - a) a lubricant level sensor capable of sensing the level of lubricant in the luber;
 - b) a lubrication flow control mechanism comprising part of the luber and capable of receiving signals to control the flow of lubricant to the bearing;
 - c) a transducer module comprising at least one online bearing condition sensor;
 - 10 d) a data gathering and processing segment capable of receiving and processing data from the transducer module and from the lubricant level sensor and capable of producing output data;
 - e) a platform for data processing capable of receiving the output data from the data gathering and processing segment and comprising computing hardware capable of storing and executing software capable of transforming the output data from the data gathering and processing segment into signals able to cause the lubrication control mechanism to increase or decrease lubricant flow from the luber;
 - f) a central monitoring station; and
 - 15 g) a communications system capable of transmitting information in both directions between the data gathering and processing segment and the data processing platform on the one hand and the central monitoring station on the other and between the data processing platform and the lubrication flow control mechanism.
2. The online bearing monitor of Claim 1 in which the lubrication flow control
25 mechanism is a piston.
3. The online bearing monitor of Claim 2 in which the lubrication level sensor indicates the position of the piston in the luber.
4. The online bearing monitor of Claim 1 in which the at least one bearing condition sensor comprises at least a vibration sensor and a temperature sensor.

5. The online bearing monitor of Claim 1 additionally comprising a power source.

6. The online bearing monitor of Claim 1 in which the communications system is wireless.

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7. The online bearing monitor of Claim 1 in which the platform for data processing is co-located with the central monitoring station.

10 8. The online bearing monitor of Claim 1 in which the platform for data processing is co-located with the data gathering and processing segment.

9. The online bearing monitor of Claim 1 in which the co-located platform for data processing and the data gathering and processing segment are further co-located with the luber.

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10. A system for automatically lubricating a bearing comprising:

a) an online bearing monitor capable of monitoring and storing heat and vibration signals from the bearing, processing the heat and vibration signals to determine the bearing's lubrication needs, and transmitting the lubrication needs of the bearing;

b) a lubrication device capable of receiving the bearing's lubrication needs and responding to those needs by providing the necessary amount of lubrication to the bearing; and

c) a sensor assembly operatively coupled to a lubrication device for detecting and generating a signal responsive to physical level of the lubricant in the lubrication device and to whether the lubrication device is operational, and transmitting the signal independently of the bearing's lubrication needs, the sensor assembly comprising:

i) at least one sensor for detecting and generating a signal responsive to physical properties of the lubrication device;

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- ii) a transmitter for transmitting signal responsive to physical properties of the lubrication device; and
- iii) a power source.

- 5 11. The system of Claim 9 in which the sensor assembly is detachable from the lubrication device.
12. The system of Claim 9 in which the transmitter is wireless.
- 10 13. A sensor assembly operatively coupled to a lubrication device for detecting and generating a signal responsive to physical level of the lubricant in the lubrication device and to whether the lubrication device is operational, and transmitting the signal independently of the bearing's lubrication needs, the sensor assembly comprising:
- 15 i) at least one sensor for detecting and generating a signal responsive to physical properties of the lubrication device;
- ii) a transmitter for transmitting signal responsive to physical properties of the lubrication device; and
- iii) a power source.
- 20 14. The system of Claim 13 in which the sensor assembly is detachable from the lubrication device.
15. The system of Claim 13 in which the transmitter is wireless.
- 25 16. An automatic bearing lubrication system, comprising:
- a) a luber;
- b) a lubricant level sensor capable of sensing the level of lubricant in the luber;
- c) a lubrication flow control mechanism capable of receiving signals to control the flow of lubricant to the bearing;
- 30 d) a transducer module comprising at least one online bearing condition sensor;

- e) a data gathering and processing segment capable of receiving and processing data from the transducer module and from the lubricant level sensor and capable of producing output data;
 - f) a platform for data processing capable of receiving the output data from the data gathering and processing segment and comprising computing hardware capable of storing and executing software capable of transforming the output data from the data gathering and processing segment into signals able to cause the lubrication control mechanism to increase or decrease lubricant flow from the luber;
 - g) a central monitoring station; and
 - h) a communications system capable of transmitting information in both directions between the data gathering and processing segment and the data processing platform on the one hand and the central monitoring station on the other and between the data processing platform and the lubrication flow control mechanism.
- 15 17. The online bearing monitor of Claim 16 in which the lubrication flow control mechanism is a piston.
18. The online bearing monitor of Claim 17 in which the lubrication level sensor indicates the position of the piston in the luber.
- 20 19. The online bearing monitor of Claim 16 in which the at least one bearing condition sensor comprises at least a vibration sensor and a temperature sensor.
- 25 20. The online bearing monitor of Claim 16 additionally comprising a power source.
21. The online bearing monitor of Claim 16 in which the communications system is wireless.
- 30 22. The online bearing monitor of Claim 16 in which the platform for data processing is co-located with the central monitoring station.

23. The online bearing monitor of Claim 16 in which the platform for data processing is co-located with the data gathering and processing segment.
- 5 24. The online bearing monitor of Claim 16 in which the co-located platform for data processing and the data gathering and processing segment are further co-located with the luber.